



Reconsidering Tree Fruit as Candidate Crops Through the Use of Rapid Cycle Crop Breeding Technologies

Presented by:

DR. THOMAS GRAHAM

NASA Post-Doctoral Fellow
Kennedy Space Center



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Overview

- Dwarfing work at KSC
- Tree Crop Exclusion
 - Architecture; Juvenility; Dormancy; Harvest Index
- FasTrack™ Crop Breeding System
 - *Prunus domestica* (plums)
- Tree Crop Inclusion
- Current State of Development
- Q & A

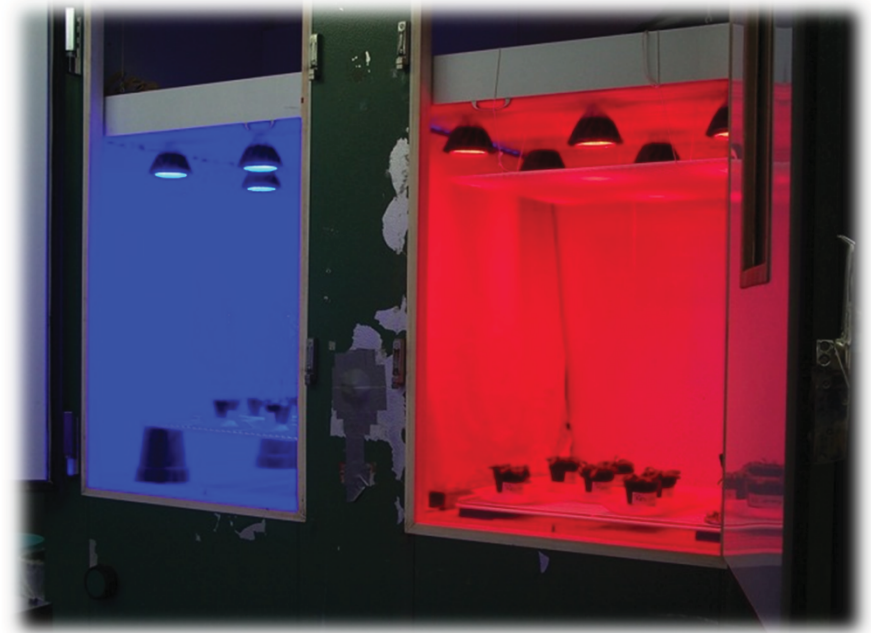


Dwarfing Work at KSC





Root Restriction



Blue Light GA
Inhibition



Tree Fruit Incompatibility



Architecture



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Tree Fruit Incompatibility



Dormancy

Photo by: Connie Painter



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Tree Fruit Incompatibility

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Tree Fruit Incompatibility

Placeholder

Harvest Index



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Candidate crops restricted to herbaceous crops

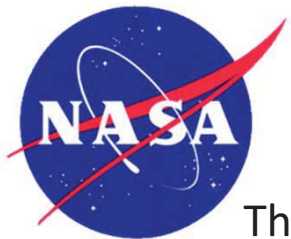


Tree fruit crops *could* contribute significantly to health crew diet and other ALS objectives...

Tree fruits precluded based on:

- Stature/size
- Long maturation phase
- Dormancy requirements
- Harvest Index





The challenge is...

Develop tree fruit cultivars that
conform to the requirements of
spaceflight and planetary
exploration life-support
systems



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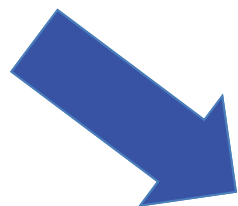
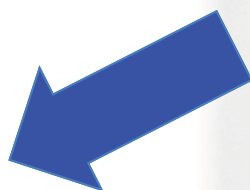
FasTrack™ Breeding System

US Patent 8,633,354 B2

Developed by USDA (Kearneysville, WV)

- Breeding disease resistance
- Breeding better traits
- Stay ahead of disease

Flowering Locus T Gene –
Populus trichocarpa



Prunus domestica





Incompatibilities

- Architecture
- Dormancy
- Juvenility
- Harvest index



Become Compatibilities



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Potential Benefits & Outcomes

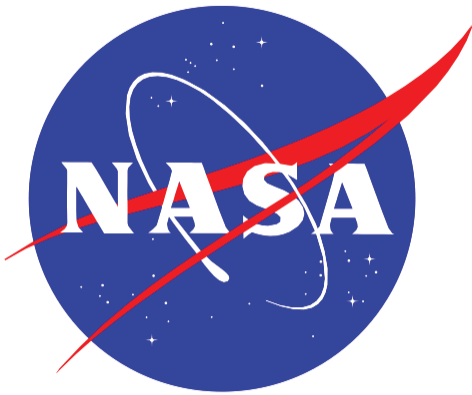
- Improved crew diet/nutrition (functional foods)
- Bone loss prevention/countermeasure
- Radiation countermeasure
- Water filtration
- ISRU
- System carbon capacitance
- Biomaterials & fibers





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Dr. Raymond Wheeler (NE-S)
 Dr. Thomas Graham (NASA NPP)
 Dr. Gioia Massa (UA-B)
 Dr. Gary Stutte (ESC)



Dr. Ralph Scorza
 Dr. Ann Callahan
 Dr. Chris Dardick
 Doug Raines

Dr. Janelle Coutts (ESC)
 Jeffrey Richards (ESC)
 Lashelle Spencer (ESC)
 Lawrence Koss (ESC)

The Team



Dr. Anna-Lisa Paul
 Dr. Robert Ferl



Dr. Brenda Smith

Questions?

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